

Integrated Structural Health Management, Phase I

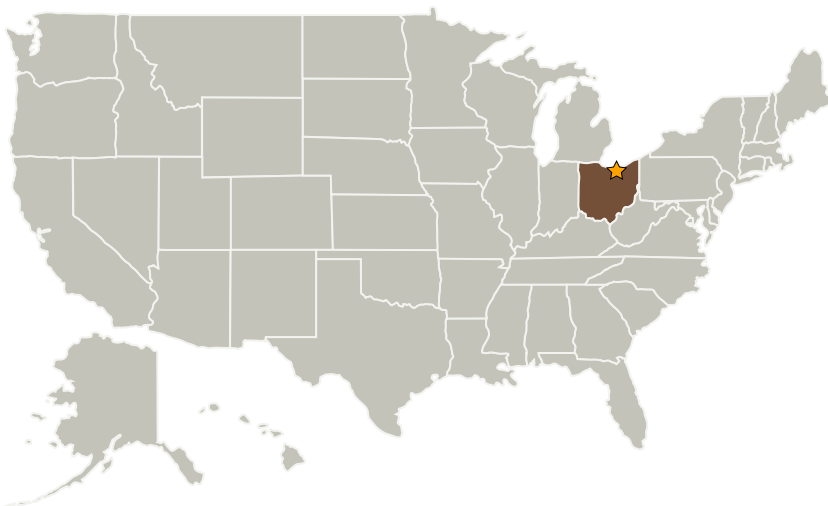
Completed Technology Project (2009 - 2009)



Project Introduction

Cornerstone Research Group Inc. (CRG) proposes to advance the state of the art in composite health management through refinement of an existing technology developed by CRG called Reflexive Composites. Reflexive Composites are the current state of the art in health management integrating piezoelectric structural health monitoring, healable polymer matrix composites, and intelligent controls delivering highly aware structures capable of identifying location and magnitude of damage with 1/16" spatial resolution. Reflexive Composites respond to damage with a healing cycle capable of restoring up to 90% of mechanical performance post failure. CRG proposes to advance the state of the art in health management through the development of a next generation control system capable of analyzing structural health monitoring (SHM) data and determining the appropriate healing cycle, identifying the type of failure in the composite, make predictions to the loss in mechanical performance, generating custom healing cycles based on failure type, healing, and making predictions of restored mechanical strength. The results of this analysis will allow the vehicle user to make any necessary mission adjustment to ensure vehicle survivability with the damaged structures on the vehicle.

Primary U.S. Work Locations and Key Partners



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Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Center / Facility:

Glenn Research Center (GRC)

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

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Organizations Performing Work	Role	Type	Location
★ Glenn Research Center(GRC)	Lead Organization	NASA Center	Cleveland, Ohio
Cornerstone Research Group, Inc.	Supporting Organization	Industry	Miamisburg, Ohio

Primary U.S. Work Locations

Ohio

Project Management

Program Director:

Jason L Kessler

Program Manager:

Carlos Torrez

Technology Areas

Primary:

- TX12 Materials, Structures, Mechanical Systems, and Manufacturing
 - └ TX12.2 Structures
 - └ TX12.2.3 Reliability and Sustainment